

ACCESSION NR: AP4017363

S/0126/64/017/002/0283/0285

AUTHOR: Tyablikov, S. V.

TITLE: On low temperature expansion in the theory of magnetism

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 283-285

TOPIC TAGS: temperature expansion technique, magnetization, dynamic interaction, nontrivial error, spin wave interaction

ABSTRACT: The errors in magnetization calculations (arising from the temperature expansion technique) because of kinematic and dynamic interactions, are shown to be of the order  $\sigma^3$  for spin  $S = \frac{1}{2}$  and of the order  $\sigma^4$  for spin  $S \geq 1$ . The two-variable temperature of Green's functions is used, and the relative magnetization  $\sigma_s$  is expanded in powers of  $P_s$ , where  $P_s \sim O(\sigma^{3/2})$ , thus

$$\sigma_s = \begin{cases} \frac{1}{2} - P_{1/2} + 2P_{1/2}^2 + O(P_{1/2}^3); & S = \frac{1}{2} \\ S - P_s + O(P_s^3); & S \geq 1. \end{cases}$$

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This shows that the first nontrivial error from spin wave interaction is of the order  $\mathcal{O}^3$  for  $S = \frac{1}{2}$  and  $\mathcal{O}^4$  for  $S \geq 1$ . This is in good agreement with the calculations of F. Dyson (Phys. Rev., 1956, 102, 1217). The author thanks D. Ter Haar for sending him Hewson's 1963 preprint. Orig. art. has: 9 formulas.

ASSOCIATION: Matematicheskiy institut, im. V. A. Steklova AN SSSR (Institute of Mathematics, AN SSSR)

SUBMITTED: 10Jul63

DATE ACQ: 18Mar64

ENCL: 00

SUB CODE: MM

NO REF Sov: 006

OTHER: 006

Card 2/2

TYABLIKOV, S.V.

Low-temperature decomposition and the theory of magnetism. Fiz. met.  
i metalloved. 17 no.2;283-285 F '64. (MIRA 17:2)

1. Matematicheskiy institut imeni V.A. Steklova AN SSSR.

TYABLIKOV, S. V.; YAKOVLEV, Ye. N.

Extending the spin wave method to finite temperatures. *Fiz.*  
tver. tela 5 no. 1:137-141 Ja '63. (MIRA 16:1)

1. Matematicheskiy institut imeni V. A. Steklova AN SSSR 1  
Institut fiziki vysokikh davleniy AN SSSR, Moskva.

(Potential, Theory of) (Statistical mechanics)  
(Nuclear spin)

~~TYABLIKOV, B.V.~~

Equation for the magnetization of an isotropic ferromagnetic material in the case of arbitrary spin. Fiz. met. i metalloved. 16 no.3:321-323 S '63. (MIRA 16:11)

1. Matematicheskiy institut imeni V.A.Steklova AN SSSR.

TYABLIKOV, S.V.

Low-temperature decomposition in the theory of ferromagnetism.  
Fiz. met. i metalloved. 15 no.5:641-651 My '63. (MIRA 16:8)

1. Matematicheskij institut im. V.A. Steklova.  
(Ferromagnetism)

TYABLIKOV, S.V.

Low-temperature decomposition in the theory of ferrromagnetism.  
Fiz. met. i metalloved. 15 no.6:801-812 Je '63. (MIRA 16:7)

1. Matematicheskiy institut imeni V.A. Steklova AN SSSR.  
(Ferromagnetism) (Dielectrics)

TYABLIKOV, S.V.; BONCH-BRUYEVICH, V.L.; ORLOVA, I.A., red.; POPOVA, N.S., tekhn. red.

[Perturbation theory for double-timed thermal Green's functions] Teoriia vozmushchenii dlia dvukhvremennykh temperaturnykh funktsii Grina. Moskva, Izd-vo Mosk. gos. univ. 1962. 65 p. (MIRA 16:8)  
(Perturbation) (Green's functions)

TYABLIKOV, S.V.

Low-temperature expansions in the theory of ferromagnetism.  
Dokl. AN SSSR 149 no. 3:573-576 Mr '63. (MIRA 16:4)

1. Matematicheskiy institut im. V.A. Steklova AN SSSR. Predstavлено  
академиком N.N. Bogolyubovym.  
(Ferromagnetism) (Metals at low temperatures)

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757710006-7

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757710006-7"

MOROZOV, Yu.N.; TYABLIKOV, Yu.Ye. (Moskva)

Using hydraulic pulsating machines for tests under natural  
conditions. Izv.AN SSSR, Otd.tekh.nauk no.12:59-65 D '58.

(MIRA 11:12)

(Fatigue testing machines)

MOROZOV, Yu.N.; TYABLIKOV, Yu.Ye.

Comparative indices of testing units operating in cycles and  
equipped with a hydraulic excitation device. Zav.lab. 26 no.12:  
1411-1420 '60. (MIRA 13:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut stroitel'nykh  
konstruktsiy.  
(Testing machines)

L 34059-66 EWT(m)/T DJ  
ACC NR: AP6025518

SOURCE CODE: UR/0115/66/000/001/0053/0057

AUTHOR: Tyablikov, Yu. Ye.

37

C

ORG: none

TITLE: Causes of errors in alternating hydraulic pulsators

SOURCE: Izmeritel'naya tekhnika, no. 1, 1966, 53-57

TOPIC TAGS: hydraulic device, fatigue test, pipeline, mechanical engineering

ABSTRACT: The author studied three classes of error sources in fatigue

tests of large specimens on hydraulic pulsers of the alternating type:  
1. purely kinematic sources of errors which are independent of body forces;  
2. dynamic-kinematic sources; 3. dynamic sources of errors due to the forces  
of inertia. Analytic expressions are derived for evaluating these categories  
of errors, and the theoretical data are checked experimentally on a TsDM-  
200 Pu machine. A diagram of the experimental setup is given. The error  
analysis and the experiments show that the metrological equipment for alternating

hydraulic pulsators should be chosen on the basis of a detailed study of  
dynamic processes in the machine under all possible test conditions.  
Particular attention should be given to dynamic drag in the tubes--a fundamental  
source of error. It should be taken into consideration that inertial and  
viscous drags are increased by a reduction in the quantity of moving liquid//  
due to cross section without changing the length of the pipelines. Orig. art.  
has: 3 figures, 7 formulas and 3 tables. [JPRS: 35,995]

SUB CODE: 13, 20 / SUBM DATE: none / ORIG REF: 004 / OTH REF: 001

UDC: 681.2.088.1:539.3

0916 0897

Card 1/1

TYABLIKOV, Yu.Ye.

Increasing the reliability of hydropulsator testing.  
Zav.lab. 31 no.4:488-492 '65.

(MIRA 18:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut  
stroitel'nykh konstruktsiy.

MOROZOV, Yu.N., inzh.; TYABLIKOV, Yu.Ye., kand. tekhn. nauk

Hydraulic excitation of cyclic loads in a wide frequency range. Vest. mashinostr. 44 no.6:37-41 Je '64.

(MIRA 17:8)

MOROZOV, Yu. N.; KALAYDZYAN, R.A.; OGANESYAN, A.T.; TRAVUSHKIN, G.M.;  
TYABLIKOV, Yu.Ie.; CHESTNIKOV, V.M.; FONGAUZ, V.N.

Instrumentation of hydropulsating racks manufactured in the  
Soviet Union. Zav.lab. 28 no.10:1270-1274 '62 (MIRA 15:10)

1. TSentral'nyy nauchno-issledovatel'skiy institut stror'tel'nykh  
konstruktsiy, Spetsial'noye konstruktorskoye byuro ispytatel'nykh  
mashin i Armavirskiy zavod ispytatel'nykh mashin.  
(Testing machines)

MOROZOV, Yu.N., TYABLIKOV, Yu.Ye.

Comparative indices of testing under cyclic operation  
with hydraulic pulsation. Zav.lab. 26 no.7:871-877 '60.  
(MIRA 13:7)

(Fatigue testing machines)

SOV/24-58-12-9/27

AUTHORS: Morozov, Yu.N.,  
Tyablikov, Yu.Ye. (Moscow)

TITLE: Hydropulsators Applied to Full-Scale Testing  
(Gidropulsatory v primenenii k naturnym ispytaniyam)

PERIODICAL: Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh  
Nauk, 1958, Nr 12, pp 59-55 (USSR)

ABSTRACT: In full-scale fatigue testing of engineering structures, frequencies of the order of hundreds or thousands of c/s can be generated by electromagnetic or electrodynamic means. For structures with lower natural frequencies, hydropulsators, which cover the frequency range from 2 to 20 c/s, can be used. Considerable progress has been made with the application of hydropulsators (Ref.1-3) and in particular with the development of pulsating jacks (Ref.4). The paper considers the application of a pulsating concentrated force (Fig.1) or a couple (Fig.7) to a beam and the resulting bending moments in the beam are derived and displayed graphically (Fig.2-5). Special attention being given to the possibility of simulating a moving load by adjusting the points of application and the

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SOV/24-58-12-9/27

Hydropulsators Applied to Full-Scale Testing

phases of the pulsating jacks. On the basis of the theoretical considerations, a schematic arrangement (Fig.9) of pulsating jacks (1,2,3,9,10,11), hydropulsators (4,5), hydraulic valves (7,8) and a hydraulic accumulator (6) is described. The paper is a continuation of earlier work (Ref.1 and 2). There are 3 tables, 10 figures and 5 references of which 3 are Soviet, 1 German and 1 English.

SUBMITTED: 9th October 1957.

Card 2/2

ACC NR: AP6036883

(A)

SOURCE CODE: UR/0122/66/000/011/0015/0016

AUTHOR: Zhulev, Yu. K. (Engineer); Tyablikov, Yu. Ye. (Candidate of technical sciences)

ORG: none

TITLE: Service life of packings in hydraulic cylinders

SOURCE: Vestnik mashinostroyeniya, no. 11, 1966, 15-16

TOPIC TAGS: packing material, hydraulic equipment, rubber, polymer

ABSTRACT: One of the most important elements which determines the reliability and service life of hydraulic machines is the packing of the hydraulic cylinder, whose construction and material depend on the purpose of the machine, the speed of the movement, the load, and the pressure. The article reports the results of an investigation of the friction loss, the sealing capacity, and the service life of leather, rubber and polymer packings, and of split cast iron rings, in hydraulic cylinders with a diameter from 82 to 207 mm at pressures up to  $400 \text{ kg/cm}^2$  and velocities up to 15 meters/min. The friction loss was calculated by the formula:

$$J_s = \frac{P_n - P_o}{P_n + P_o} \cdot 100\%,$$

where  $P_n$  and  $P_o$  are the true values of the load on the piston, determined by a

UDC: 62-762.63:620.162.4

Card 1/2

ACC NR: AP6036883

dynamometer, at a given pressure, for the forward stroke and the backward stroke. The service life of the packings was determined in cyclical tests of the cylinders under pressure in hydropulse equipment. The basic criterion of the service life of a packing was the amount of wear at which the leakage attained 2 liters/sec. The results show that the friction losses in cylindrical couples with packing consisting of split cast iron rings are of the same order of magnitude as the losses using rubber packing; at  $p = 200 \text{ kg/cm}^2$ , they amount to 2%. Cylindrical couples with a working surface up to  $125 \text{ cm}^2$ , packed with split cast iron rings, can be used under a cyclic pressure of  $150 \text{ kg/cm}^2$ , at forward velocities up to 15 meters/min, while rubber packings can be used at the same pressure and at velocities up to 10 meters/min. However, it was found that the service life of the cast iron rings is five or six times greater than that of the rubber packings. Orig. art. has: 5 figures.

SUB CODE: 11 / SUBM DATE: none / ORIG REF: 003

Card 2/2

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757710006-7

TYABLINSKIY, R.E., inzhener.

Simple cable testing bridge. Prom.energ. 10 no.5:13-15 My '53. (MLRA 6:5)  
(Electric lines--Testing)

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757710006-7"

TYABIN, N. V.

Colloids

Similarity of flow of a plastic-viscous liquid. Koll. zhur. 14 No. 4, 1952.

Monthly List of Russian Accessions, Library of Congress, September 1952. UNCLASSIFIED

28924  
S/124/61/000/004/025/033  
A005/A126

24.4300 also 1583

AUTHOR: Tyabin, N. V.

TITLE: The rheodynamic theory of viscous-plastic lubrication

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 4, 1961, 99, abstract 4 B 674.  
(Tr. Kazansk. s.-kh. in-ta, 1958, no. 39, 132 - 150)

TEXT: The author briefly reviews Soviet and foreign publications. He treats the problem of flow of a viscous-plastic lubricant in a plane bearing. For solving it he uses his equations (see abstract 4 B 673) of the two-dimensional motion of a viscous-elastic-plastic medium in a boundary layer; by some simplifications he reduces his equations to the known Reynolds equations for a lubricant layer. He considers the lubricant-layer flow in the zone between an infinite plane moving with constant velocity  $u$  and a fixed plate of length  $L$  and width equal to unity which is inclined to the plane. The entire zone of flow is divided into three subzones in which different boundary conditions are to be satisfied. The distributions of velocities and pressures are found for each subzone. The author proves that stopper zones exist on the surfaces of movable and fixed plates for  $k \approx h_1/h_2 \geq 2$ , where  $h_1$  is the width of the entrance section, and  $h_2$  that of the

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2832<sup>b</sup> S/124/61/000/004/025/033  
The rheodynamic theory of viscous-plastic lubrication A005/A126

The rheodynamic theory of viscous-plastic lubrication. He finds the width of the layer moving with constant velocity in the outlet section to be  $y_2 = h_2(k-2)/(k+1)$  and the stability conditions of the stopper zones. He proves that practically no flow exists in the stopper zones even at high velocity gradients of the order of  $10^5 - 10^6 \text{ sec}^{-1}$ . Furthermore, he determines the supporting power of the bearing, the coefficients of loading capacity and resistance, and the friction force affecting the moving plate with and without stoppers. He compares the data obtained with the analogous data for pure viscous lubricant and determines the specific behavior of viscous-plastic lubricants in sliding bearings: 1) for  $k \geq 2$  discontinuity of the lubricant layer appears in the case of viscous lubricant, which leads to leakage of lubricant from the clearance and insufficient lubrication; continuous rigid stoppers practically ensure a full viscous-plastic lubrication whereupon the entrance stopper prevents air from getting into the lubricant layer. These effects are advantageous in using viscous-plastic lubrication. 2) viscous-plastic lubrication ensures a more uniform distribution of pressure, which shows by decreasing specific load on the area of bearing bushing and, consequently, by wear lower than when using oils. 3) plasticity increases the resistance coefficient of viscous-plastic lubricants, which lowers the operation quality in sliding bearings in comparison with oils.

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The rheodynamic theory of viscous-plastic lubrication  
There are 15 references.

28324  
S/124/61/000/004/025/033  
A005/A126

A. Safronchik

[Abstracter's note: Complete translation]

Card 3/3

TYABIN, N. V.

Diffusion

Flow of a viscous-plastic fluid of the dispersive system in the diffuser and the immersion of a wedge in a dispersive system. Dokl. AN SSR, 84, No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1953, Uncl.

TYABIN, N. V.

Diffusion

Flow of a viscous-plastic fluid of the dispersive system in the diffuser and the  
immersion of a wedge in a dispersive system. Dokl. AN SSSR, 84, No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October <sup>1952</sup> ~~X 1953~~, Uncl.

TYARLIKOV, S.

On M.F. Deigen's and X.B. Tolpygo's letter concerning the review of  
S.I. Pekar's book "Studies of the electron theory of crystals."  
Usp. fiz. nauk 51 no.3:428-430 N '53. (MLRA 6:12)  
(Crystallography)

24,2200

S/058/61/000/007/059/086  
A001/A101

AUTHORS: Tyablikov, S.V., Shiklosh, T.

TITLE: Quantum theory of monoaxial anisotropic ferromagnetics

PERIODICAL: Referativnyy zhurnal, Fizika, no. 7, 1961, 285, abstract 7E<sup>495</sup>  
("Acta phys. Acad. scient. hung.", 1960, v. 12, no. 1, 35 - 46,  
Engl. summary)

TEXT: The dependence of magnetization of anisotropic ferromagnetics on temperature and magnetic field was calculated by the method developed earlier (RZhFiz, 1960, no. 5, 10938) with the aid of Green's two-time retarded and advanced functions. Anisotropy of magnetic properties is considered as a consequence of the angular dependence of electrons exchange interaction in incomplete shells. The results obtained are valid for the entire region of temperatures from absolute zero to Curie point.

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[Abstracter's note: Complete translation]

Card 1/1

MOROZOV, Yu.N.; TYABLIKOV, Yu.Ye.

Comparative indices of cyclic testing machines having hydraulic inducing devices. Zav.lab. 27 no.11:14.01-14.11 '61. (MIRA 14:10)

1. Tsentral'nyy nauchno-issledovatel'skiy institut stroitel'nykh konstruktsiy.  
(Testing machines)

TUSHINSKIY, O.K.; TYABTSEVA, K.M.

The International Geophysical Year. Geog. v shkole 21 no. 1:1-14  
Ja-F '58. (MIRA 11:7)  
(International Geophysical Year, 1957-1958)

OVSYANNIKOV, S.G., kand. ekon. nauk; GRINMAN, G.I.; SHIPUNOV, I.F.;  
DRANICHNIKOV, I.F.; TYABUT, M.A.; KOLEVICH, A.G., red.;  
TORKAYLO, I., red.; DIK, V., tekhn. red.

[Accounting and auditing on collective farms; practical aid]  
Bukhgalterskii uchet i revizionnaia rabota v kolkhozakh;  
prakticheskoe posobie. Minsk, Sel'khozgiz BSSR, 1961. 246 p.  
(MIRA 15:7)

(Collective farms--Accounting)

RUSINOV, A.A.; VOSKOBONYIKOV, V.N.; DUBINKO, T.P.; ILYUSHIN, V.I.;  
VRUBLEVSKAYA, F.L.; BUNCHUK, M.I.; RIABEN'KIY, L.M.; MARGOLIN,  
D.I.; SAZYKINA, K.V., kand.ekon.nauk; BUGAREVICH, V.S.;  
KUPTSOVA, V.A.; KALINOVSKIY, M.D.; MELESHKEVICH, O.A.;  
TYABUT, M.A., red.; LAZARCHIK, K., red.; KALECHITS, G.,  
tekhn.red.

[Reference book on the establishment of work norms on collective  
farms] Spravochnik po normirovaniyu truda v kolkhozakh. Minsk,  
Gos.izd-vo BSSR, Red.sel'khoz.lit-ry, 1960. 151 p.

(MIRA 14:3)

1. Akademiya sel'skokhozyaystvennykh nauk BSSR. Institut ekono-  
miki. 2. Institut ekonomiki i organizatsii sel'skokhozyaystvennogo  
proizvodstva Akademii sel'skokhozyaystvennykh nauk BSSR (for  
Voskobonyikov, Dubinko, Ilyushin, Trublevskaya, Bunchuk, Bugarevich,  
Kuptsova, Kalinovskiy). 3. Starshiy inspektor Upravleniya po  
orgkolkhoznym delam Ministerstva sel'skogo khozyaystva BSSR (for  
Meleshkevich).

(Agriculture--Production standards)

TYACHENKO, P. E.

USSR/ Engineering - Surface quality conference

Card 1/1      Pub. 124 - 17/45

Authors : Tyachenko, P. E., Dr. of Techn. Sc.

Title : International conference on the microgeometry of surfaces in Leningrad

Periodical : Vest. AN SSSR 2, 78-80, Feb 1955

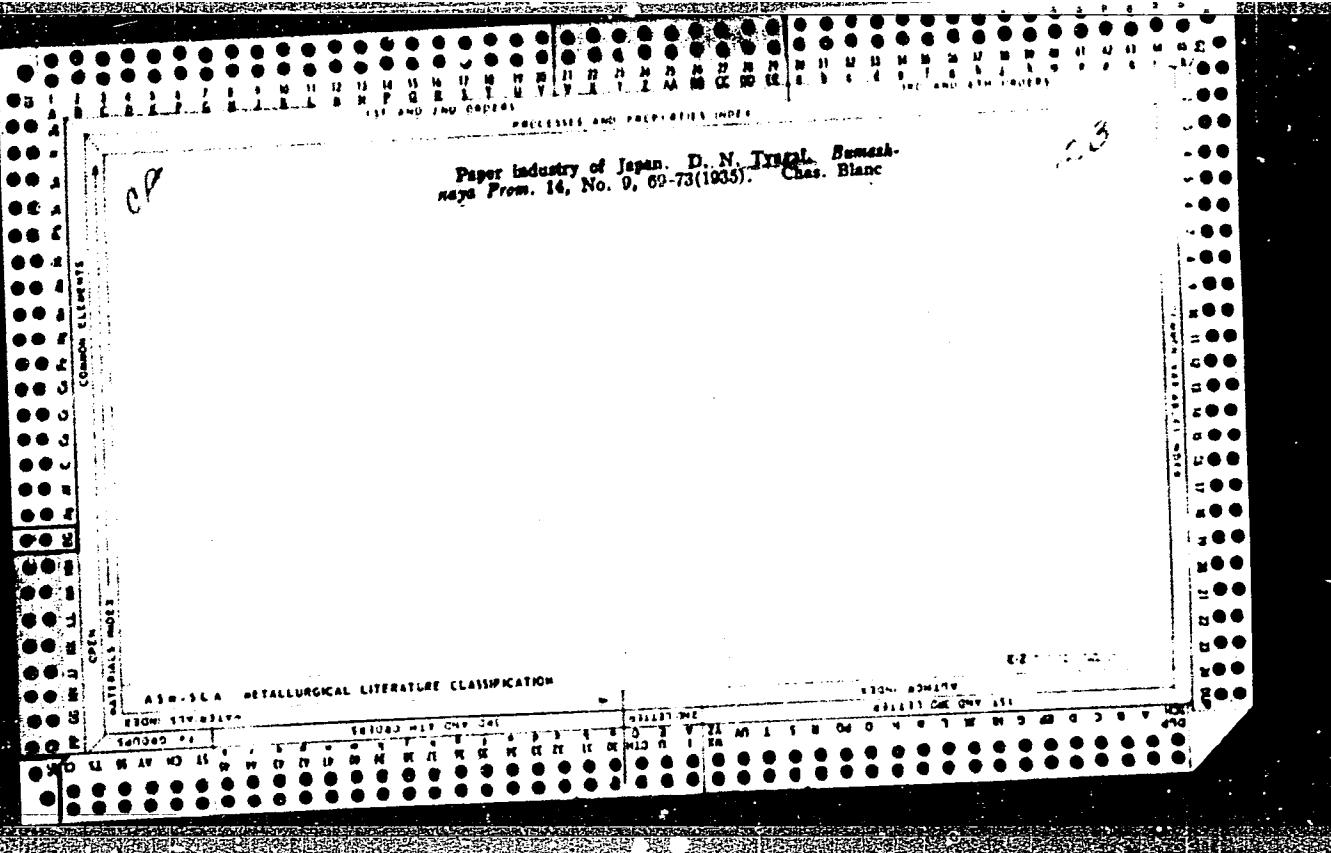
Abstract : Brief report is presented on the activities of the International Conference held in Leningrad during November 17-19, 1954, where international standardization of surface micro-geometry (micron as a unit of measurement) was reported. The resolutions adopted at the conference are listed.

Institution : .....

Submitted : .....

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CIA-RDP86-00513R001757710006-7"

USMANOV, Kh.U.; YUL'CHIBAYEV, A.A.; TYAGAY, E.D.; BEKMAYEVA, A.D.

Change of the structure of cotton cellulose when treated with  
acid solutions. Uzb. khim. zhur. 7 no.6:84-87 '63.  
(MIRA 17:2)

1. Tashkentskiy gosudarstvennyy universitet imeni Lenina.

TYAGAY, G.

Review of the organization of work and production at ship  
repairing yards. Mor. flot 25 no.10:34-35 O '65.  
(MIRA 18:11)

1. Starshiy inzh. Glavnogo upravleniya tekhnicheskoy  
ekspluatatsii flota i sudoremontnykh zavodov Ministerstva  
morskogo flota.

KIM, G.F., otv.red.; VAYNTSVAYG, N.K., red.; LEZIN, V.V., red.;  
SAMSONOV, G.Ye., red.; TYAGAY, G.D., red.; SHABSHINA F.I.,  
red.; ANGORA, T.M., red.izd-va; GAMAZKOV, Y.A., red.izd-va;  
TSVETKOVA, S.V., tekhn.red.

[Southern Korea; economic and political conditions from 1945  
through 1958] IUzhnaia Koreia: ekonomicheskoe i politicheskoe  
polozhenie, 1945-1958 gg. Moskva, Izd-vo vostochnoi lit-ry,  
1959. 270 p. (MIRA 13:2)

1. Akademiya nauk SSSR. Institut vostokovedeniya.  
(Korea, South--Economic conditions)  
(Korea, South--Politics and government)

TYAGAY, G.D.; MEDVEDEV, Ye.M., red.izd-va; TSIGEL'MAN, L.T., tekhn.red.

[Through Korea; travels, 1885-1896] Po Koree; puteshestvia,  
1885-1896 gg. Moskva, Izd-vo vostochnoi lit-ry, 1958. 291 p.  
(MIRA 12:11)

1. Akademiya nauk SSSR. Institut vostokovedeniya.  
(Korea--Description and travel)

TYAGAY, V.A.

Differential capacity of cadmium sulfide - electrolyte solution  
interface. Izv.AN SSSR. Ser.khim. no.1:34-39 Ja '64.

(MIRA 17:4)

1. Institut elektrokhimii AN SSSR.

S/181/62/004/002/005/051  
B102/B138

AUTHORS: Tyagay, V. A., and Pleskov, Yu. V.

TITLE: Study of the surface recombination rate at the interface  
between germanium and an electrolytic solution

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 343-349

TEXT: The effect of the composition of a solution and external field strength on the surface recombination rate was studied by the method of photoconductivity drop. Thin germanium plates 5·15·0.2-0.5 mm, with diameter less than the diffusion length of the minority carriers were provided with ohmic contacts (Sn+Sb for n-type and Sn+In for p-type Ge), and placed in aqueous solutions of high-purity NaOH, KI and  $K_3Fe(CN)_6$ . They were illuminated by a pulsed lamp (3  $\mu$ sec pulse duration) and the conductivity increase due to photoeffect was amplified and shown on a MO-4 (IO-4) oscilloscope. The germanium samples investigated had the following parameters: n-type: 40/2.5, 20/1.5, 3/0.7; p-type: 20/1, 3/0.7 (resistivity/minority carrier diffusion length). Results were as follows: 1) The curve for the dependence of effective lifetime  $\tau_e$  and

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Study of the surface recombination...

S/181/62/004/002/005/05:  
B102/B138

current on the electrode potential  $\varphi$  and the  $\varphi_s$ -dependence of the surface recombination rate  $s = \frac{w}{2} \left( \frac{1}{\tau_e} - \frac{1}{\tau_o} \right)$  ( $w$  - specimen thickness,  $\tau_o$  - volume lifetime) (Fig. 2) has the same shape as for a dry Ge surface, but the peak is 3.8 kT further over toward positive values, which gives a hole to electron trapping cross section ratio:  $C_p/C_n \approx 1800$ . The half-width of the curve, determined by the energetic position of the recombination centers relative to the middle of the forbidden band, was 3.6 kT. 2) Surface recombination for anodic polarization of the germanium specimen was very little affected in the case of p-type Ge, as  $\tau_e$  hardly changes in the region of anodic dissolution, and there is a maximum current of anodic dissolution. 3) The influence of composition on surface recombination was studied by measuring the  $\tau_e$  and the stationary potential  $\varphi$  in dependence on the composition (Fig. 4) and  $\tau_e$  as a function of  $\varphi$  for positive and negative polarization. In both cases  $\tau_e$  decreases with increasing  $|\varphi|$ . In 0.1 N KI solution anodic dissolution was abnormally high and the recombination rate

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3

Study of the surface recombination...

S/181/62/004/002/005/0..1  
B102/B138

increased. 4) Cathodic hydrogen separation reduces  $\tau_e$  and raises the surface recombination rate, e.g. to 2000 cm/sec for n-type Ge of 3 ohm·cm. There are 6 figures and 18 references: 7 Soviet and 11 non-Soviet. The four most recent references to English-language publications read as follows: W. W. Harvey. J. Phys. Chem. Solids, 14, 82, 1960; W. W. Harvey. J. Phys. Chem. 65, 1641, 1961; H. U. Harten. J. Phys. Chem. Solids, 14, 220, 1960; J. B. Flynn. J. Electrochem. Soc. 102, 715, 1958.

ASSOCIATION: Institut elektrokhimii AN SSSR Moskva (Institute of Electrochemistry AS USSR, Moscow)

SUBMITTED: July 24, 1961

Fig. 2. Surface recombination rate as a function of surface potential for n-type Ge of 20 ohm·cm.

Fig. 4. Effective lifetime (curve 1) and stationary Ge potential (2) variations when oxygen and nitrogen are added (n-type Ge, 20 ohm·cm).

Card 3/4 3

TYAGAY, V.A.

Kinetics of a ferricyanide ion reduction on the cadmium sulfide surface. Electrckhimia 1 no.4:387-393 Ap '65.

(MIRA 18:6)

1. Institut elektrokhimii AN SSSR.

TYAGAY, V.A.; GALINKER, V.S.; FENERLI, G.N.

Systems CdCl<sub>2</sub> - MCl - H<sub>2</sub>O based on electric conductance data.  
Zhur.neorg.khim. 7 no.5:1154-1158 My '62. (MIRA 15:7)

1. Kiyevskiy politekhnicheskiy institut.  
(Cadmium compounds--Electric properties)  
(Systems (Chemistry))

TYAGAY, V.A.

Kinetics of photoelectric effect in the exhausted layer of a  
semiconductor. Zhur. fiz. khim. 38 no.10:2472-2474 O '64.  
(MIRA 18:2)

1. Institut elektrokhimii AN SSSR.

1.0000000000000000E+0000

1.0000000000000000E+0000 V/A

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electrode, charging curve, semiconductor electrode, electrode polarization

"APPROVED FOR RELEASE: 08/31/2001

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GALINKER, V. S.; TYAGAY, V. A.; FENERLI, G. N.

Viscosity of mixtures of aqueous solutions of electrolytes.  
Zhur. fiz. khim. 36 no.12:2638-2643 D '62.  
(MIRA 16:1)

1. Kiyevskiy politekhnicheskiy institut.

(Electrolyte solutions) (Viscosity)

Journal of Electrochemistry Society, Vol. 138, No. 10, October 1991, pp. 2950-2954.

TOPIC: Investigation of constant current density surface recombination rate of Ge at the interface between Ge and aqueous electrolytes.

INSTITUTION: Institute of Applied Physics, USSR Academy of Sciences, Tver, Russia, 170000

TOPIC TACS: Ge surface conductivity, Ge surface recombination  
the

ABSTRACT: Effects of type of electrolyte and field strength at the interface on the surface conductivity and surface-recombination rate of Ge were investigated experimentally. Resistivities of the emitter, base, and collector were 0.16, 7, and 0.001 m<sup>2</sup>, respectively; base width, 1.1 mm. The surface conductance was measured with the transistor immersed in a small beaker, carbon tetrachloride, N-methyl-formamide, and purified water. Current densities 10<sup>-10</sup> and 10<sup>-11</sup> A/cm<sup>2</sup> were used. At the same time, different concentrations of the electrolytes were used. With the increase of the concentration of the electrolytes, the surface conductance increased by 1-3 orders.

Card 1/2

Surface-recognition rate was determined to be approximately 40%.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 15 May 63 ENCL: 00

SUB CODE: PH, GE NC REF Sov: 002 OTHER: 006

Card 2/2

ACCESSION NR: AP4039640

S/0181/64/006/006/1602/1607

AUTHOR: Tyagay, V. A.

TITLE: Investigation of the nature of pulsed photoeffect on the interface of cadmium sulfide electrolytic solution

SOURCE: Fizika tverdogo tela, v. 6, no. 6, 1964, 1602-1607

TOPIC TAGS: photoeffect, cadmium sulfide, hydrochloric acid, electrolytic solution, energy barrier, ionic double layer, photoelectric current, photoelectric electromotive force, illuminator type OI 20, chopper, selenium photoelement, semiconductor

ABSTRACT: It was determined in an earlier work (V. A. Tyagay. Izv. AN SSSR, OKhN, No. 1, 42, 1964), that the height of the surface barrier in the semiconductor could be found from the differential capacitance of an electrolytic solution of CdS. The magnitude of the photo-emf was obtained from the jump in potential across the ionic double layer. In this work the results of an experimental investigation of the photoelectric effect on the boundary of an electrolytic solution of CdS are given. Experiments were performed on thin monocrystalline samples obtained by synthesis from the gaseous phase and alloying of cadmium in a growth process, and also on

Card 1/3

ACCESSION NR: AP4039640

thick single crystals obtained by sublimation and alloying of  $\text{InCl}_3$ . An OI-20 illuminator was used as a light source, and the chopper was in the form of a slotted disk. The intensity of light was measured by a selenium photoelement. The form of the pulse was determined by the geometry of the slot, and the duration was 20/2000 microsec. The dependence of the pulse photo-emf on the electrode potential is given in Fig. 1 of the Enclosure. The results show that the surface barrier essentially affects the photo-emf. In the case of high resistance crystals the capacitance of the surface barrier in darkness was very low and could not be properly measured. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Institut elektrokhimii AN SSSR, Moscow (Moscow Electrochemical Institute, AN SSSR)

SUBMITTED: 300ct63

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NO REF SOV: 002

OTHER: 012

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ACCESSION NR: AP4039640

ENCLOSURE: 01

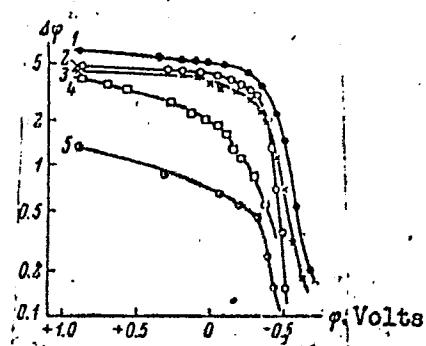


Fig. 1. Dependence of impulse photo-emf on the electrode potential.

$P$  in ohm cm: 1)  $2.7 \times 10^2$ ; 2)  $3 \times 10^6$ ; 3)  
 $5.7 \times 10^3$ ; 4)  $4.2 \times 10^2$ ; 5) 6.0

Card

3/3

TYAGAY, V.A.; PLESKOV, Yu.V.

Apparatus for electrochemical pulse measurements. Zhur.fiz.khim. 38  
no.8:2111-2113 Ag '64.  
(MIRA 18:1)

1. Institut elektrokhimi AN SSSR.

L 8195-66 EWT(1)/EWT(m)/EWG(m)/T/EWA(h) IJP(c)/ DS/GG/AT  
ACC NR: AP5025078 SOURCE CODE: UR/0364/65/001/010/1167/1173

AUTHOR: Tyagay, N. A.; Pleskov, Yu. V.

ORG: Institute of Electrochemistry, AN SSSR (Institut Elektrokhimii, AN SSSR)

TITLE: Electrochemistry of semiconductors

SOURCE: Elektrokhimiya, v. 1, no. 10, 1965, 1167-1173

TOPIC TAGS: <sup>44, 55</sup> electrochemistry, semiconductor research, electrode, semiconductor single crystal, semiconductor crystal, charge exchange, photosynthesis, direct energy conversion, crystal surface, crystallography, space charge, photochemistry, photoeffect

ABSTRACT: The state-of-the-art is presented and the most important unsolved theoretical and experimental problems of the electrochemistry of semiconductors are discussed on the basis of the latest Soviet and Western research data. About 80% of the references are Soviet.

In the author's opinion, the main areas of interest are: distribution of potential on the semiconductor-electrolyte interface, surface electronic states versus adsorption on the same interface, kinetics of the processes on semiconductor electrodes, and photoelectrochemical processes. The presently available experimental data are discussed and the nearest research goals are outlined in each of the above areas.

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UDC: 541.13:621.315:592

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ACC NR: AP5025078

In the first area of interest, that of the respective roles of the space-charge region and ionic part of the electrical double layer in discontinuity of the galvanic potential at the interface, the most recent (1965) experimental works of the authors are discussed. The main problems, still unsolved in this area, are defined as determination of the sign and magnitude of the surface charge of the single crystalline semiconductor electrode and establishment of the nature of the bond between the surface atoms of the electrode and the adsorbed species. Also, the properties of the space-charge region of the semiconductor should be investigated further because of the recently discovered discrepancy between experimental and calculated data.

In the area of the surface electronic states, recent Soviet studies on germanium failed to solve the problem of correlation between the surface charge and adsorption of extraneous species on the semiconductor surface. Another important problem is the statistical description of the changes in the surface charge, which are caused by the change in the electrode potential.

In the area of the kinetics of charge transfer across the interface, the most important problem remains the quantitative verification of the theory of electron exchange at the semiconductor-electrolyte interface.

Card 2/3

L 8195-66

ACC NR: AP5025078

"Current multiplication" in anodic dissolution of germanium, electro-deposition of metals, kinetics of adsorption from solutions, and penetration of hydrogen or alkali metals into semiconductor cathodes are the electrochemical processes not yet fully understood.

The main problem of photoelectrochemistry is the mechanism of the electrochemical process caused by the photoeffect. Soviet studies are noted in the areas of photopassivation and photoactivation, photodesorption, and photocatalytic activity of the electrodes. In light of recent Soviet findings, the studies of photoelectrochemical phenomena might contribute to development of the mechanism of photosynthesis. These studies are of particular importance for the problem of direct conversion of radiation into electrical energy.

The electrochemical studies of semiconductors should be extended to polycrystalline semiconductors, e.g., oxide films on barrier-layer metals, oxide and sulfide electrodes, and to passivity of metals. Orig. art. has: 2 formulas. /ATD Press: 4138-F/

SUB CODE: 07, 20 / SUBM DATE: 14Mar65 / ORIG REF: 019 / OTH REF: 009

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Card 3/3

1 9704-66 EWT(1)/T/EWA(h) IJP(c) GG/AT  
ACC NR: AP5027455

SOURCE CODE: UR/0181/65/007/011/3472/3474

AUTHOR: Tyagay, V. A.; Sachenko, A. V.

ORG: Institute of Semiconductors AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Calculation of quantum effects in the layer theory for space charge in semi-conductors

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3472-3474

TOPIC TAGS: semiconductor theory, space charge, quantum electronics, theoretic physics

ABSTRACT: The authors consider the expression for the density matrix of an ideal gas with a quasi-continuous energy spectrum in the single-electron approximation. Equations are given for the density matrix of a non-degenerate gas limited to infinitesimals of the second order. Equations are derived for the density of electrons and holes in the junction zone. Orig. art. has: 6 formulas.

SUB CODE: 20/

SUBM DATE: 09Mar65/

ORIG REF: 002/

OTH REF: 006

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Card 1/1

TYAGAY, V.A.

Current-voltage characteristics of the quasi-equilibrium electrochemical system. Elektrokhimiia 1 no.6;685-688 Je '65. (MIRA 18:7)

1. Institut elektrokhimii AN SSSR.

TYAGAY, V.A.; GUREVICH, Yu.Ya.

Calculating the dynamic curve of charging the surface of a  
semiconductor. Fiz. tver. tela 7 no.1:12-22 Ja '65.

(MIRA 18:3)

1. Insti'ut elektrokhimii AN SSSR, Moskva.

TYAGAY, V.A.

Nature of the pulse photoelectric effect at the interface  
cadmium sulfide-electrolyte solution. Fiz. tver. tela 6 no.  
6:1602-1607 Je '64. (MIRA 17:9)

1. Institut elektrokhimii AN SSSR, Moskva.

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ACCESSION NR: AP4010037

S/0062/64/000/001/0034/0039

AUTHOR: Tyagay, V. A.

TITLE: Investigation of differential capacitance of the boundary surface: cadmium sulfide-electrolytic solution

SOURCE: AN SSSR. Izvestiya. Ser. khim., no. 1, 1964, 34-39

TOPIC TAGS: differential capacitance, semiconductors, cadmium sulfide, concentrated electrolytic solution, Helmholtz layer, electrode potential

ABSTRACT: The purpose of the work is to estimate the potential distribution between the adjoining phases. The differential capacitance in a concentrated solution depends on diffusibility of the semiconductor part of the double layer. The potential jumps in the Helmholtz layer and in the semiconductor can be obtained from the experimentally found dependence of the capacitance on the electrode potential. The electrode impedance was measured by the bridge method. Thin single crystals of hexagonal CdS grown by the author's method (Izv. AN SSSR, Otd. khim. n.(1963), 1556) were

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ACCESSION NR: AP4010037

used as specimens. The results of measurements are given in diagrams. The frequency dependence of conductivity is explained by the existence of deep levels uniformly distributed in the volume of CdS. The capacitance and conductance of low-resistance crystals is interpreted by the theory of depleted layer. "The author is grateful to Yu. V. Pleskov for help and discussion, and to B. N. Kaoanov for comments." Orig. art. has: 7 Figures.

ASSOCIATION: Institut electrokhimii Akademii Nauk SSSR (Institute for Elektrochemistry)

SUBMITTED: 03Jul63

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NR REF SOV: 004

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Card 2/2

TYAGAY, V.A.

Electrochemical behavior of cadmium sulfide. Izv. AN SSSR Ser.khim.  
no.9:1556-1562 S '63. (MIRA 16:9)

1. Institut elektrokhimii AN SSSR  
(Cadmium sulfide crystals) (Electrochemistry)

TYAGAY, V.A.; PLESKOV, Yu.V.

Surface recombination rate on the interface germanium - electrolytic  
solution. Fiz.tver.tela 4 no.2:343-349 F '62. (MIRA 15:2)

1. Institut elektrokhimii AN SSSR, Moskva.  
(Electrolytes--Conductivity) (Germanium)

24,7700 (1158,1164,1385)

32321  
S/020/61/141/005/015/016  
B101/B144

AUTHORS: Pleskov, Yu. V. and Tyagay, V. A.

TITLE: Distribution of potentials on the interface germanium - electrolytic solution

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 5, 1964. 1135-1138

TEXT: The dependence of the space charge on the electrode potential was examined by measuring the surface recombination rate on the Ge - electrolyte interface, and the photopotential  $\Delta\varphi_{ex}$  (change of potential of the Ge electrode on exposure).  $\Delta\varphi$  was measured according to the decrease in photoconductivity of samples of 15.5 (0.2 - 0.5) mm. The samples were etched with CP-4A (SR-4A). 1 N NaOH or 1 N H<sub>2</sub>SO<sub>4</sub> were used as an electrolyte. A low voltage (50 mv) was applied to the two contacts at the ends of the lamella. The sample was exposed to the lamp of a UCI-1 (PST-1) stroboscotachometer (20 - 40 imp/sec, impulse time about 3  $\mu$ sec). The signal being proportional to photoconductivity was amplified by an YU-2 (USh-2) wide-band amplifier and reproduced on the screen of an MO-4 (IO-4).

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oscilloscope. The constant of decrease of photoconductivity, i. e. the effective lifetime  $\tau_{\text{eff}}$  of minority carriers, was determined.  $\Delta\phi_{\text{ex}}$  was measured with the same apparatus, the intensity of exposure being chosen so low that on exposure the polarization of the electrode changed by a maximum of 0.01 v. Fig. 1 presents the function  $\ell_{\text{eff}}(\varphi)$  for five samples with different electrophysical properties, and the curve of function  $\gamma(\varphi)$  (curve 6) calculated on the basis of experimental data for sample 4. In each sample,  $\Delta\phi_{\text{ex}}$  changes its sign at a certain potential. The value of  $\varphi_0$  at which  $\Delta\phi_{\text{ex}} = 0$  depends on the concentration of free electrons in Ga. The measured data confirmed the authors' assumptions: (1)  $\gamma$  shows a maximum at equal concentration of holes and electrons. (2) In this case,  $\varphi_0 = 0$  holds for the surface potential. (3) For the potential of the valence bands  $E_v$  in the center of the forbidden band equals  $E_v$  in the rest of the semiconductor. (4) The potential drop on the Helmholtz layer does not depend on  $E_p$  (Fermi level). Therefore, the potential drop  $V_0$  in the range

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of the space charge depends on the second component of the Galvani potential. (5)  $\psi_s = (E_F - E_i)/q + V_s$  does not depend on the Fermi level because a change of  $E_F$  is compensated by an inverse change of  $V_s$  ( $q$  = electron charge). (6) For the potential of plane bands,  $V_s = 0$ .

For germanium with intrinsic conductivity, the potential of plane bands was found to be -0.51 v in 1 N NaOH, and 0.13 v in 1 N  $H_2SO_4$ , in good

agreement with Ref. 7 (see below). For the potential of plane bands, the volume charge of the semiconductor equals zero. The electrode surface, however, is negatively charged due to oxidation. The amount of this charge depends on the pH of the electrolyte. Electrostatic adsorption of cations occurs. The structure of the double layer at the Ge - electrolyte interface with potential of plane bands reminds of the mercury surface in the zero point with specific adsorption of iodine ions. There are 3 figures and 8 references: 1 Soviet and 7 non-Soviet. The four most recent references to English-language publications read as follows: J. F. Dewald, Semiconductors, Ed. N. B. Hannay, N. Y., 1959, p. 727; M. Green, Modern Aspects of Electrochemistry, Ed. J. O'M. Bockris, 2, 1959, p. 343;

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Distribution of potentials on the ...

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B101/B144

J. F. Dewald, The Surface Chemistry of Metals and Semiconductors, Ed. H.C. Gatos, 1960, p. 205; Ref. 7: H. Gerischer, Advances in Electrochemistry, N. Y., 1961.

ASSOCIATION: Institut elektrokhimii Akademii nauk SSSR (Institute of Electrochemistry of the Academy of Sciences USSR)

PRESENTED: July 21, 1961, by A. N. Frumkin, Academician

SUBMITTED: July 20, 1961

Fig. 1.  $\tau_{\text{eff}}(\phi)$  for five Ge samples. Electophysical properties of samples.

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Card 4/4

TYAGAY, V.A.

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